Non-Voice Completion of Voice Calls

BACKGROUND OF THE INVENTION

Field of the Invention

5   The present invention relates to voicemail systems, and in particular to voicemail systems that provide message retrieval in a non-voice format.

Description of the Related Art

Call answering is an extremely popular service. Conventional voice-based call-

10   completion messaging systems enable callers to leave messages for unavailable parties, such that the called parties are required to call their voice mailboxes to retrieve their messages. Conventional voice-based call-completion messaging systems do not provide instant notifications, or alternative means for accessing the actual message content.

Current call-answering and call-completion systems allow the caller to leave the

15   called party a voice message, when the called party is unavailable to receive the call. This system is quite convenient for the caller, but places a degree of inconvenience on the called party. The inconvenience results from the fact that the called party needs to perform the operation of calling the voice mailbox and retrieving the message. The retrieval is inconvenient because:

20   i. The retrieval is relatively time consuming. In the case of mobile telephone subscribers, this time translates into increased airtime and commensurate expense.

ii. The retrieval is intrusive: the called party cannot retrieve a message quietly during a meeting, but must make a telephone call and concentrate accordingly in order to hear the message.

iii. In the case of calling a wireless telephone subscriber, if the called party does not have his/her cellular/wireless telephone on hand, s/he may not be able to access the voicemail box, or even know that a message has been left for them.

iv. Commonly, the retrieval is not performed until a relatively large time interval has passed, often causing the message to lose relevance, and thus missing the caller's original purpose in leaving the message.

An additional, and increasingly important, dimension of voice messaging is responding to the message. When a called party retrieves a stored voice message, he or she may want to rapidly contact or respond to the calling party. A common way to do this is by return call or by return voice message. Often, however, these methods may not be quick or convenient enough in gaining the calling party's attention, as the calling party may have switched devices and may no longer be available on, or have access to, his or her voice device.

Various prior art examples of solutions for these problems are available, such as:

US Patent number 6,006,087 describes a method and system for delivering a voice mail notification to a subscriber using a cellular telephone network. This invention, incorporated herein by reference, describes a way to notify a cellular user that a voice message has been left in their mailbox, so that the called party can call the voice mail system in order to retrieve the message. This invention enables the reduction of the time

lag between the leaving of a message and the notification to the called party, but does not enable the passing on of the actual contents of the message to the called party.

PCT application number WO002367A1 describes a voice mail server system, which transmits voice messages to a mobile station. According to this invention, which is incorporated herein by reference, a system is provided to adapt, transmit, receive and readapt a voice message, in order to deliver it without a delay to a mobile station. According to this invention, a voice message is not retrieved by the recipient but rather actively pushed to the handset by the network. In this way, the invention merely deals with an efficient format for the voice content to be coded and delivered.

Current technologies dealing with this field include:

"Cellcomtext:" (www.cellcom.co.il/index.html) is a system for sending text messages to a subscriber, such that a caller may use voice commands to compose and send messages. This system enables immediate notification to the subscribers mobile telephone, via Short Messaging Service (hereinafter "SMS"), and enables subscribers to silently access the actual content of messages. The disadvantage is that the messages are limited to a pre-programmed list of common messages. Furthermore, the sender needs to be aware of the service's existence, and must remember the number of the service, in order to dial in to receive the original (audio) messages. The process of composing a reply message is time consuming and limited in alternatives, as it is dependant on similar interaction with an Interactive Voice Response (hereinafter "IVR") system, and a limited selection of messages.

A similar technology is Globelines Landline Texting system (http://www.globe.com.ph/), which provides a system that enables sending text messages composed via landline telephones. These telephones require proprietary client software, and enable composition of text messages using DTMF-based dialing (typing key numbers 1-4 times for the letter or symbol required). This system uses an IVR system and aids the user by providing a list of pre-composed messages.

VocalLink (http://www.vocallink.com/faq.asp) is a system that enables users to listen and reply to all messages, whether email, voicemail or faxes, using any telephone, computer or wireless device from one central location. Voice messages are either transmitted as .WAV files, or converted to text using a speech to text converter. Access to messages is achieved via calling in to a central location. This system requires phoning into central number to access a users messages.

Various other technologies provide messaging services, such as universal messaging, Internet messaging etc., whereby voice and other messages are transmitted to various devices, and can be accessed by those devices, when convenient for the called party. In universal messaging (UM), for example, the calling party sends messages via existing media, in the accustomed manner, and the UM system's contribution is to gather them all into one central inbox. UM does not in any way change the process of the message deposit. A voice message remains a voice message, and a text message remains a text message.

There is thus a widely recognized need for, and it would be highly advantageous to have, a system that can enable a caller to leave a voice message for a presently not-available call receiver (hereinafter referred to as a called person (CDP), wherein the caller

may use any voice enabled device to leave a message, and the receiver may use any device to receive themessage according to the preferences of both the caller and receiver.. Moreover, it would be advantageous to enable switching of the message medium within the course of the calling party's deposit/message creation process.

5   Furthermore it would be advantageous to push the message to the receiver instantly, and for the receiver to exercise control over how and when to receive the message.

There is a further need for, and it would be advantageous to have, a system that can enable a message receiver to respond to a message sender immediately, by composing a message using voice, and having the system automatically send it to the original sender in a non-voice format.

SUMMARY OF THE INVENTION

According to the present invention there is provided a system for allowing a calling party, a person initiating a call (hereinafter CGP) to leave a voice message for a called party (hereinafter CDP or subscriber) who is unavailable, and enabling the called party to receive the original voice message in various non-voice formats, including SMS, via various communication devices. The present invention enables both automatic voice-to-text conversion and media switching, whereby the calling party leaves the message in voice format, and the message is converted to text and transferred to a message receiver device chosen by the CDP. The present invention also includes the options of choosing a pre-configured textual message or composing a partially pre-recorded message, via a voice/IVR interface. The present invention also includes a function to enable a CDP to

reply to a message using a conventional voice-based device, such that the voice reply is converted and sent to the original message sender in a non-voice format.

The present invention provides a solution for the limitations in the current voice-mail systems, by providing a system that allows the caller to send a message to a called party, in such a way as to gain the immediate attention of the called party. This is achieved by having the system send the called party content of an actual message, from within the voice mailbox, via one or more of several non-voice media, including:

SMS: Internet-based Instant Messaging ("IM") service

E-mail

Fax

Pager

Any other IP based messaging service

The advantages of the present invention over the known Prior Art include:

1. Advantages over conventional voice-based call-completion:

• The CDP retrieves the message "instantly", i.e. can read the message very quickly as compared to voice call answering. The time involved in the retrieval process in vastly improved. The CDP can get the message silently, for example, during a meeting.

- The CDP will commonly read the message shortly after it is sent, thereby ensuring that the message is still relevant. This reflects an improvement in the time interval between deposit and retrieval.

2. Advantages over "Cellcomtext"

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- The calling party (CGP) does need to be aware of the service at the time of composing the message. Rather, the natural flow of the Call completion process guides her or him and leads her/him in the use of the service.

- Cellcomtext is not part of the Call Answering and Completion process. It requires calling into a provider database in order to receive voice messages, and

10 limits conversion to text to a limited selction of pre-programmed messages.. The present invention, in contrast, is integrated into the the Call Answering and Completion process, in that voice messages are automatically converted to text, and transferred to subscribers. These subscribers thereby receive the actual content of voice messages without having to dial in to any service numbers, and

15 without having to navigate IVR or text menus. Replying to such messages is also vastly simplified, according to the present invention, as the replyer need only execute a reply command and dictate the message. This voice message will be delivered to the relevant destination device, and where necessary, will be translated into a text form and transferred to the original sender as a SMS, email,

20 fax or IM message, or in some other non-voice format.

3. Advantages over conventional SMS

- The system of the present invention provides a way of sending SMS and other textual messages, even if the sender does not posses a mobile telephone, or another device capable of sending SMS messages to the CDP.

5 - The present invention enables composing messages by voice or text, which can be instantly sent to any communication device, which automatically receives the messages in either voice or non-voice format.

The present invention therefore includes the following innovative aspects:

1. Allowing CGP to easily send messages in a plurality of non-voice formats via any

10 (fixed or mobile) telephone, or communication device, and

2. Allowing convenient, instant textual call-completion messages from within the existing framework of voice-based call completion services.

The preferred embodiment mode of the present invention provides for a system

15 for sending a message to a called party from within a voice mailbox, via non-voice media. This system is comprised of:

i. a communications device for enabling message sender to send a message;

ii. a communications device for enabling a called party (CDP) to receive at least one message from the calling party (message sender); and

20 iii. a Call Answering System ("CAS") for processing and handling the sending and receiving of the message.

According to this preferred mode, a method is provided for automatically completing a voice call via non-voice means. An alternative mode of the present invention provides for a method for switching a message medium from voice to text, within the course of a calling party's deposit process.

A further mode of the present invention provides a system for enabling a caller to send short message service (SMS) messages via a conventional telephonic communications device. An additional mode of the present invention is a system that enables a message receiver to respond to a message sender immediately, by having the system send back a voice or non-voice message to a sender of an original message, from within a voice mailbox. This embodiment furthermore consists of a system for enabling a voice message receiver to reply to the voice message by sending at least one short message service (SMS) message via a voice-enabled communications device. This embodiment also incorporates a new method for executing a non-voice response to a voice message.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is herein described, by way of example only, with reference to the accompanying drawings, wherein:

FIGURE 1 is a block diagram illustrating the Call Answering System of the invention in the context of telecommunications infrastructure.

FIGURE 2 is a block disgram of the present invention.

FIGURE 3 is a flowchart illustrating the process according to the present invention .

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to a system and method for enabling the completion of voice calls that are directed toward receiving parties who are not currently available. Specifically, the present invention can be used to complete and respond to voice calls by non-voice means, and moreover to change the process of a message deposit, wherein the invention switches the message medium within the course of a calling party leaving a message to a second person or a group of people.

The following description is presented to enable one of ordinary skill in the art to make and use the invention as provided in the context of a particular application and its requirements. Various modifications to the preferred embodiment will be apparent to those with skill in the art, and the general principles defined herein may be applied to other embodiments. Therefore, the present invention is not intended to be limited to the particular embodiments shown and described, but is to be accorded the widest scope consistent with the principles and novel features herein disclosed.

The present invention refers to the following terms and phrases, which are defined below:

CAS: Call Answering System

AVRS: Automatic Voice Recognition Server

CDP: CalleD Party or Subscriber, the party being called

CGP: CallinG Party, the party initiating a call

IM: Instant Messaging

IVR: Interactive Voice Response system

SMS: Short Message Service

The principles and operation of a system and a method according to the present invention may be better understood with reference to the drawings and the accompanying description, it being understood that these drawings are given for illustrative purposes only and are not meant to be limiting, wherein:

5   The Block Diagram in **figure 1** provides an illustration of the communications architecture into which the present invention fits. As can be seen, a calling Party (CGP) **110** initiates a call to a called party (CDP) **122** of a system. The call gets channeled via the Public Switched Telephone Network (PSDN) **112**. If the CDP **122** is available, the call gets directed directly to the CDP **122**. If the CDP **122** is not available, the call is

10   forwarded to the Call Answering System (CAS) **114** of the present invention. Here the calling party **110** leaves a message, which is processed, as will be described below. The processed message passes to the Messaging Center **116** where it is configured for transfer to at least one of a plurality of end-user devices. If the message must be sent to a wire-based destination, it will be sent via a wire-based infrastructure to the CDP **122**. If the

15   call is sent to a wireless device, the message is channeled to a mobile switching center **118**, and then on to a cellular base station **120**. From here the message is transferred to a CDP or wireless subscriber **122**.

The Block Diagram in **figure 2** provides a description of the building blocks of the present invention. A user, the CallinG Party ("CGP") **10**, wishes to call a CalleD

20   Party ("CDP") **12**. A voice call to an available CDP **12** is directed via the PSDN **112** to the CDP **12**. In the case where the CDP **12** is unavailable, the call is forwarded to a Call Answering System ("CAS") **114/14**, configured to handle and implement the call answering and call completion processes.

In the case where a CGP **10** chooses to leave a voice message, the call answering

system (CAS) **14** sends the voice content to an "Automatic Voice Recognition Server"

(AVRS) **24**. This component, either internal or external to the CAS **14**, translates the

voice into a non-voice format, such as text, by employing the necessary voice recognition

5   software.

An example of such software is Comverse Network System's "Tel@Go voice-

recognition assistant" (http://www.comverse.com/solutions/spee_por.htm). The voice

recognition software component required for the working of the present invention may be

of various standards. Currently, most voice recognition software packages are either able

10   to be trained by the user to recognize his/her basic language, or at least are able to

recognize and convert basic conversational words. In addition, it is expected that a

relatively limited vocabulary will comprise a large portion of the terms used in common

messages (e.g. "Call", "Meeting", "Later", "Ten-thirty"). This limited vocabulary can

greaatly enhance automatic speech response (ASR) performance to the degree that a very

15   high percentage of messages will be correctly recognized. This level of voice recognition

suffices for the requirements of the present invention, since the gist of a message, or at

least basic instructions may be understood and processed.

It is anticipated that future voice recognition software systems will provide better

recognition, which will enable greater usability of the present invention. The text format

20   of the original voice message may then be returned to the CAS **14**. In this way, a voice

message left by a calling party **10** can be converted on the fly (in real-time or almost real-

time) to a textual message, in order to arrive at the called party **12** via the chosen voice or

non-voice means. The CAS **14** makes use of various possible application software

programs, referred to as application tools, including a Fax Emulator **16**, e-Mail Interface **18**, Instant Messaging (IM) Interface **20**, and SMS Interface **22**, as needed, or a combination thereof. These mediums are used to process and send messages in the respective formats, so that these messages will be readable to a plurality of

5 communication devices. These devices include PC's, facsimiles, handheld computers, notebook and mini notebook computers, wireless telephones and any other communication gadgets and devices. In the case where the converted voice message is too long to be sent as a conventional SMS message, the converted message may be broken up into more than one SMS message, the combination thereof presenting to the

10 CDP the complete converted message.

The Process

The Flowchart in figure 3 describes the process of the invention.

The CGP **10** wishes to call the CDP **12**. In the case where the CDP **12** is unavailable

15 **1010**, the CGP **10** is transferred **1020** to the CAS **14**. The CAS **14** communicates with the CGP **10** via Interactive Voice Response (IVR), and offers the option of sending the CDP **12** a conventional call-completion voice message or a non-voice (such as textual) message **1030**.

If the CGP **10** chooses to leave a conventional voice message, the process is

20 handled in an identical manner to prior art Voice Call Answering services **1040**, wherein the voice message is forwarded to the mailbox of the CDP **12**.

If the CGP chooses to leave a textual message, the CAS **14** guides her/him through the process of choosing and/or composing the message **1050**. The message may

optionally be a pre-recorded message or one of several "canned" messages, i.e. pre-

prepared messages in an existing list, such as "Call Me" or "I Love You". The called

party (CDP) **12**, or subscriber, may pre-program any number of canned messages, and

may specify which messages may be used for which calling party etc. The message may

5   also contain a part that must be chosen by the CGP **10**, such as a textual section of the

message that is not "canned" or pre-selected, but needs to be selected during the message

composition. This section may alternatively be entered via a conventional telephone

keypad. For example, the CGP **10** may be required to leave a specific message type in the

form of, "The meeting is at HH:MM", where the CGP **10** chooses the time of the

10   meeting, and the system enters it into the message, via voice, keypad etc. Another

example of such message parts are telephone numbers, such that these may be used to

specify personal information. For example, a telephone number that the CGP **10** is

requested to call may be entered: "Please call number NN-NNNNNNN".

The chosen or composed voice message is sent to the Automatic Voice

15   Recognition Server (AVRS) **24**, where the voice data is converted into a text format,

using the necessary voice recognition software. The AVRS **24** returns the converted

message to the CAS **14**. The CAS **14** then optionally makes use of a Fax Emulator **16**, e-

Mail Interface **18**, Instant Messaging (IM) Interface **20**, and/or SMS Interface **22**, as

necessary, to further format and prepare the message in order to send the message in the

20   appropriate format and via the medium chosen by the CGP **1060, 1070, 1080**. Each of

these application tools are taken from existing software systems, for example, application

tools from Comverse Network Systems, Inc. (www.comverse.com, Wakefield, Mass.,

USA). The SMS interface **22** enables automatic translation of a voice message into text,

such that the text can be used as a SMS message. The email interface **18**, the IM interface

20, and Fax emulator **16** perform functions similar to the SMS interface **22**, according to

the nature of the destination of the message. It is thereby possible to compose a message

by speech on various devices or platforms, and subsequently translate the speech to text,

5   for all forms of non-voice messaging. This invention thereby enables the changing of the

process of the message deposit, wherein the invention switches the message medium

within the course of the calling parties deposit process.

ALTERNATE EMBODIMENTS

10   An additional embodiment of the present invention is a system for enabling a

called party (CDP) **12** to reply by voice to a message received from a calling party (CGP)

10, such that the reply message may be sent to the CGP in various non-voice formats via

any preferred communications device. This embodiment allows the (original) CDP **12**

(now the call responder) to respond immediately to the (original) CGP **10**, by having the

15   system send back a voice response in a non-voice format to the CGP **10**. This takes place

from within the voice mailbox, without waiting for the original sender to access the

message manually. The sending of the message is executed via one or more non-voice

media, including SMS, Instant Messaging ("IM"), E-mail and Fax.

According to this embodiment:

20   A calling party (CGP) **10** attempts to call a called party (CDP) **12**. If the CDP **12** is

unavailable, the CGP **10** is routed to the call answering service (CAS) **14**, whereby the

CGP **10** leaves a voice or non-voice message for the CDP **12**. Alternatively if the CDP **12**

is not a user or subscriber to the system, a voice is left in the CDPs **12** conventional voice mailbox.

The message receiver or CDP **12**, if not a user or subscriber to the system, may access the conventional voice mailbox (existing in prior art voice answering systems) to retrieve the voice message. Alternatively, according to the preferred embodiment of the present invention, the CDP **12** automatically receives the message in text form. The system subsequently prompts the CDP **12** to respond to the CGP **10**. This response may be either by a return call, regular voice message, by notifying the CGP **10** that the CDP **12** is now available to accept messages via his or her chosen device, or by leaving a non-voice message.

Accordingly, the CDP **12** may call the CGP **10** using a voice enabled telephonic device, or any other communications device. If the CGP **10** is available, a voice call can proceed. If the CGP **10** is not available (ie. is not connected to a network, does not answer the call, initiates voice mail etc.), the CDP **12** may compose a voice message to be sent to the CGP **10** via non-voice means, to the device at which the CGP **10** is currently available or otherwise chosen by the CGP **10**. The call system may assume availability on the same device from which the original message was sent, or alternatively may request of the CGP **10** when leaving the initial message to specify his or her preferred rules for receiving messages, such as his or her preferred receipt address or device, his or her preferred format, and his or her preferred times etc. The CDP "knows" which device is currently being used by the CGP, since the telephone number of the calling device is presented. This number commonly identifies whether the device is wireline or mobile.

Alternatively, an availability service like Comverse Network System's "Nex2ME" (http://www.comverse.com/solutions/comm_ent.htm) stores information on each subscribers' present device or preferred means of receiving messages. Such a system facilitates instant communications between mobile and Internet users by allowing users to

5   set their own availability status and connect with other users based on predefined criteria. Alternatively the CGP can choose based on their familiarity with the other party. This may be sent via a plurality of means, including SMS, IM, e-mail, or fax. If the CDP **12** chooses to compose a non-voice message using a voice-enabled device, the system prompts the CDP **12** to compose a message by one of three means:

10   i. Choosing one of an existing list of pre-configured messages. This list will include default messages such messages as "Call me", "Next meeting cancelled", I love you", etc.

ii. Composing the message by speech, whereby the system sends the voice message to an Automatic Voice Recognition Server **24**, where it is converted to a textual message, and returned in text-format to the CAS **14**.

15   iii. Composing the message by voice or any other input means, by selecting and adding to a pre-recorded message, such that part of a prepared message is taken from a pre-recorded message, and at least one additional part of the composed message is chosen by the CGP **12**. For example, the CDP **12** may be required to leave a specific message type in the form of, "The meeting is at HH:MM", where the CDP **12** chooses the time of the

20   meeting, and the system enters it into the message. This additional part may be added via voice input, keypad or any other type of input.

Finally, the CDP **12** chooses or composes a message, as described above, and the CAS **14** sends the message, optionally via more than one of the available services, to the CGP **10**. In this way the CDP **12** may use voice means to contact a CGP **10** in an immediate way, in a non-voice format on any text enabled communications device.

5   Several other embodiments are contemplated by the inventors. The present invention as described above may also be implemented with or without notification of the CDPs **12** availability via various media, and with or without text-to-speech capability.

ADVANTAGES OF THE PRESENT INVENTION

Advantages of the present invention include: allowing a CGP **10** or a CDP **12** to 10   easily send, receive and manage SMS messages via any (fixed or mobile) telephone or communication device that is voice enabled, from within the existing framework of voice-based call completion services.

The foregoing description of the embodiments of the invention has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to 15   limit the invention to the precise form disclosed. It should be appreciated that many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not by this detailed description, but rather by the claims appended hereto.